



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|------------------------|---------------------|------------------|
| 10/567,177 | 02/03/2006 | Erlind M. Thorsteinson | 62575A | 6742 |
| 35503 | 7590 | 06/25/2009 | | |
| Union Carbide Chemicals and Plastics Technology Corporation P.O. Box 1967 Midland, MI 48641-1967 | | | EXAMINER | |
| | | | MICALL, JOSEPH | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1793 | |
| | | | MAIL DATE | DELIVERY MODE |
| | | | 06/25/2009 PAPER | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/567,177

Applicant(s)

THORSTEINSON, ERLIND M.

Examiner

Joseph V. Micali

Art Unit

1793

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 6/15/09
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. The arguments filed June 15th, 2009 have been entered. Claims 1-10 remain pending in the application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. **Claims 1-3 and 5-10 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 4,874,739 by Boxhoorn, in view of US Patent No. 6,417,136 by Cheung et al.**

With respect to claim 1, Boxhoorn teaches a process for the preparation of a silver-containing catalyst suitable for the oxidation of ethylene to ethylene oxide. Specifically, Boxhoorn teaches a step of impregnating a preformed alpha-alumina carrier (**claim 1**), which has been subjected to calcining and, optionally, other preforming treatments, as part of the preforming process (**claim 1 and column 2, lines 44-66**), with at least one alkali metal hydroxide modifier (**claim 3 with respect to claim 1, step c**). Boxhoorn teaches an optional step

of drying the impregnated carrier (**column 4, lines 16-20**). Boxhoorn also teaches a step of washing the final carrier (**column 5, lines 8-11 and lines 30-35**).

Boxhoorn does not explicitly teach calcining subsequent to impregnation with the alkali metal salt.

Cheung is drawn to a hydrocarbon hydrogenation catalyst and process of making. Specifically, Cheung teaches calcining a metal-incorporated alumina to produce a carrier (**claim 1**), wherein the metal is incorporated by impregnation (**claim 2**). Furthermore, Cheung teaches that the process can involve the following steps: impregnating the alumina carrier with palladium, drying, calcining, then impregnating with a catalyst component, drying, and calcining (**claim 65**). Finally, Cheung teaches the addition of both silver and an alkali metal compound impregnated by an alkali metal hydroxide (**column 6, lines 30-65**).

At the time of invention it would have been obvious to a person of ordinary skill in the art to perform the process of Boxhoorn including the addition of a subsequent calcining step after impregnation with the alkali metal salt, in view of the teaching of Cheung. The suggestion or motivation for doing so would have been to produce a carrier and catalyst having preferred and suitable physical features of surface area, pore volume, average pore diameter, and crystalline domain size (**column 14, lines 45-49**).

With respect to claim 2, Boxhoorn teaches a step of depositing silver catalytic material on the calcined carrier (**claim 1**), as does Cheung (**see rejection supra**).

With respect to claim 3, Boxhoorn teaches a method wherein calcining is carried out a temperature of 800° C to 1800° C (**claims 11-12**). It would be obvious for both calcining steps to

occur within the same temperature range, as calcining happens at a set range. Thus, the same temperatures would be used for each calcining step.

With respect to claim 5, Boxhoorn teaches a method wherein the alpha-alumina carrier is prepared by contacting boehmite alumina and/or gamma-alumina with an acidic mixture containing halide anions and water (**claim 2 and column 1, line 54 - column 2, line 2**).

With respect to claim 6 and 7, Boxhoorn teaches a method wherein at least one efficiency enhancing promoter is deposited on the preformed alpha-alumina carrier, with the promoter comprising a rhenium-containing compound (**claim 1 and column 3, lines 42-48**).

With respect to claim 8, Boxhoorn teaches a method wherein said alkene is ethylene (**claim 1**).

With respect to claim 9, Boxhoorn teaches a method wherein the alkali metal hydroxide is present in an amount from 0.01 to 5.0 weight percent, based on the total weight of the modified alumina carrier (**claim 15**).

With respect to claim 10, Cheung explicitly teaches the alkali metal hydroxide being sodium hydroxide (**column 7, line 17**).

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 4,874,739 by Boxhoorn in view of US Patent No. 6,417,136 by Cheung et al, as applied to claim 1 or 2 above, in view of US Patent No. 4,994,589 by Notermann.

Boxhoorn teaches a process for the preparation of a silver-containing catalyst suitable for the oxidation of ethylene to ethylene oxide. Boxhoorn teaches an extrusion of the alumina mixture in the form of shaped carrier particles (**claim 22**), specifically the shaped alpha-alumina particles comprise bars, rings, pellets, tablets and triangles (**column 3, lines 5-9**).

Boxhoorn and Cheung, however, do not teach the shaped alpha-alumina carrier having a morphology comprising interlocking platelets.

Notermann teaches a process for epoxidation of an alkene including a supported silver catalyst. Specifically, the support consists essentially of alpha-alumina and the support particles have platelet-type morphology (**claim 1**). These platelets are shown to be interlocking (**Figure 1 as well as column 13, lines 8-14**). Both Boxhoorn and Notermann teach a silver-containing catalyst on an alpha-alumina carrier support and different types of morphologies the carrier could take.

At the time of invention it would have been obvious to a person having ordinary skill in the art to modify the product of Boxhoorn and Cheung by including an interlocking platelet morphology in view of the teaching of Notermann. The suggestion or motivation for doing so would have been to improve crush strength, pore volumes, and surface areas, thereby providing high performance characteristics of short term stability or high activity and long term stability (**Notermann, column 13, lines 17-22**).

Response to Arguments

6. Applicant's arguments filed on June 15th, 2009 have been fully considered but they are not persuasive.

With regards to applicant's first argument (pg. 5), applicant asserts that there is no motivation to combine. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references

themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, examiner maintains a sufficient basis for suggestion or motivation has been provided from the text, and furthermore, reiterates that “knowledge generally available to one of ordinary skill in the art” is also sufficient as clearly defined in the rejections in which it is stated that “the suggestion or motivation for doing so would have been to produce a carrier and catalyst having preferred and suitable physical features of surface area, pore volume, average pore diameter, and crystalline domain size”.

In addition, with regards to hydrogenation vs. epoxidation catalysts, applicant argues against the references individually, and one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Finally, in response to applicant's argument that the Cheung reference is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, examiner maintains proper usage of the reference, as both are strongly rooted in the field of catalysis.

With regards to applicant's second argument (pg. 5), examiner maintains the supplied suggestion or motivation to combine in the rejection above, and absent evidence otherwise, maintains that such benefits would arise from the combination of references.

With regards to applicant's third argument (pg. 6), once again applicant argues against the references individually, and one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Furthermore, applicant's argues that as the impregnation of an alkali metal compound prior to impregnation of a silver compound is "purely an optional and arguably less preferred embodiment", such suggested benefits would not arise from the combination of references. This is not persuasive, as the combination is drawn to the calcination for the proposed benefits, not the impregnation.

Finally, applicant's arguments (pg. 7), with regards to the novelty of the current invention, fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

With regards to applicant's arguments against the claim 2 rejection, such arguments are not persuasive, as both references teach the depositing of silver catalytic material, regardless of palladium in the Cheung reference.

With regards to applicant's arguments against the claim 3 rejection, examiner would like to point to Cheung, column 14, lines 52-57. Both references teach the calcination temperature range claimed, and thus, either reference or the combination of both (which is, after all, the purpose for combination i.e. secondary calcination) suffices to reject claim 3.

With regards to applicant's arguments against the claim 5 rejection i.e. an acidic mixture of boehmite alumina and/or gamma alumina, examiner maintains the last office action's

response, in that an alkali metal fluoride salt would be in the mixture. Thus, though not explicitly mentioning the acidity, it would necessarily follow that such a mixture would be acidic.

With regards to applicant's arguments against the claim 10 rejection, the usage of Cheung has been shown relevant and would have been available to one having ordinary skill in the art at the time the invention was made.

With regards to applicant's arguments against the claim 4 rejection, examiner maintains the rejection, as such applicant does not make any new grounds of argumentation to negate the inclusion of Notermann.

Conclusion

7. Claims 1-10 are rejected.
8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph V. Micali whose telephone number is (571) 270-5906.

The examiner can normally be reached on Monday through Friday, 7:30am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry A. Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Joseph V Micali/
Examiner, Art Unit 1793

/Michael A Marcheschi/
Primary Examiner, Art Unit 1793